

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



aTC425  
.P53M6

**Final**  
**Environmental Impact Statement**

**PIERCE CREEK NO. 2 WATERSHED**  
**Page and Montgomery Counties**  
**Iowa**

AD-33 Bookplate  
(1-63)

**NATIONAL**

**A  
G  
R  
I  
C  
U  
L  
T  
U  
R  
A  
L**



**LIBRARY**

USDA-SCS-EIS-WS-(ADM)-75-1-(F)-IA

PIERCE CREEK NO. 2 WATERSHED PROJECT  
PAGE AND MONTGOMERY COUNTIES, IOWA

FINAL ENVIRONMENTAL IMPACT STATEMENT

WILSON T. MOON  
STATE CONSERVATIONIST  
SOIL CONSERVATION SERVICE

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

JUL 30 1976

CATALOGING - PREP.

SPONSORING LOCAL ORGANIZATIONS

Page County Soil Conservation District, Shenandoah, Iowa 51601  
Montgomery Soil Conservation District, Red Oak, Iowa 51566  
Page County Board of Supervisors, Shenandoah, Iowa 51601  
Montgomery County Board of Supervisors, Red Oak, Iowa 51566

March 1975

Prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Des Moines, Iowa 50309



TABLE OF CONTENTS

|  | <u>Page</u> |
|--|-------------|
| SUMMARY SHEET . . . . .  | iii         |
| PROJECT PURPOSES . . . . .   | 1           |
| PLANNED PROJECT . . . . .  | 2           |
| Land Treatment . . . . .   | 2           |
| Structural Measures . . . . .  | 6           |
| Operation and Maintenance . . . . .                                    | 8           |
| Project Costs . . . . .  | 9           |
| ENVIRONMENTAL SETTING . . . . .  | 10          |
| Physical Resources . . . . .   | 10          |
| Plant and Animal Resources . . . . .                                   | 13          |
| Economic Resources . . . . .   | 14          |
| Soil, Water and Plant Management Status . . . . .                      | 15          |
| Recreational Resources . . . . .                                       | 16          |
| Archeological and Historical Resources . . . . .                       | 16          |
| WATER AND RELATED LAND RESOURCE PROBLEMS . . . . .                     | 16          |
| Erosion Damage . . . . .   | 16          |
| Sediment Damage . . . . .  | 17          |
| Floodwater Damage . . . . .  | 17          |
| Plant and Animal Resource Problems. . . . .                            | 17          |
| RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS. . . . .         | 18          |
| ENVIRONMENTAL IMPACTS . . . . .  | 18          |
| Conservation Land Treatment . . . . .                                  | 18          |
| Structural Measures . . . . .  | 19          |
| FAVORABLE ENVIRONMENTAL EFFECTS . . . . .                              | 21          |
| ADVERSE ENVIRONMENTAL EFFECTS . . . . .                                | 22          |
| ALTERNATIVES . . . . .   | 22          |
| SHORT-TERM VS. LONG-TERM USE OF RESOURCES . . . . .                    | 22          |
| IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES . . . . .      | 24          |
| CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS . . . . . | 24          |
| LIST OF APPENDIXES . . . . .   | 30          |





Pierce Creek No. 2 Watershed Project  
Page and Montgomery Counties, Iowa

Prepared in Accordance with  
Sec. 102(2)(C) of P.L. 91-190

## SUMMARY SHEET

## I Final

## II Soil Conservation Service

## III Administrative

IV Description of Action - A project for watershed protection and flood prevention in Page and Montgomery Counties, Iowa, to be implemented under authority of the Watershed Protection and Flood Prevention Act (PL 566, 83rd Congress, 68 Stat. 666), as amended.

V Summary of environmental impact and adverse environmental effects: The project will protect 640 acres of land from voiding and depreciation by gully erosion in the next 50 years. A reduction in damages from floodwater will be realized on 40 acres. The reduction of damages from sediment deposition in channels affecting 430 acres will be realized. Benefits will be realized from the reduction of road damages at 3 locations within the watershed and reduction of peak flows will permit installation of smaller and less costly culverts at 2 locations in the watershed. Eleven acres of cropland, 32 acres of pasture and 6 acres of forest land will be permanently inundated by the project. Twenty-three acres of cropland, 22 acres of pasture and 2 acres of forest will be periodically flooded by the temporary pools behind the structures. Agricultural use will be foregone and wildlife use will be interrupted until revegetation is accomplished on 13 acres of cropland, 11 acres of pasture and 3 acres of forest that will be used for structures and spillways. Four miles of ephemeral stream channel will be inundated by the project.

VI Experience has shown that no practical alternative exists to using grade stabilization structures for the elimination of gully erosion damage. During the early stages of plan formulation a local interest was shown in recreation as a purpose. During technical planning it was found that no site was suited for this purpose. Recreation as a purpose was then abandoned.

## VII Comments were received from:

Advisory Council on Historic Preservation  
Department of the Army, Corps of Engineers  
Department of Health, Education & Welfare  
Department of the Interior  
Department of Transportation  
Environmental Protection Agency

Governor of Iowa (Dept.  
of Soil Conservation)  
Iowa Department of  
Environmental Quality  
Iowa Highway Commission  
Iowa Historic Preservation  
Department  
State Clearinghouse (Office  
for Planning & Programming)

III Final Statement transmitted to CEQ on  
Draft Statement received by CEQ on September 20, 1974.



USDA SOIL CONSERVATION SERVICE

FINAL ENVIRONMENTAL IMPACT STATEMENT<sup>1/</sup>  
for  
Pierce Creek No. 2 Watershed  
Page and Montgomery Counties, Iowa

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Page County Soil Conservation District  
Montgomery Soil Conservation District  
Page County Board of Supervisors  
Montgomery County Board of Supervisors

PROJECT PURPOSES

The project sponsors, landowners and the Soil Conservation Service share a common goal in protecting the resource base of the watershed which in turn will permit sustained use and provide continuing quality as a place to live.

The long range goal of land users in the project area is to eliminate excess soil and land degradation from sheet and gully erosion. They have already established a fine record on attaining this goal. During the installation period of the project, the ongoing program of the soil conservation district is expected to adequately protect 630 acres of cropland and 250 acres of pasture. The cumulative total to the end of this period is expected to be 65% of the project area adequately protected.

The project structures will give control of all gullies that require project type action. When the land treatment goal during the project installation period is reached, the active gully erosion in the area will be controlled.

Crops on 40 acres of flood plain are damaged each year. The project goal for this land is to protect the crops from flood damage in 4 out of 5 years.

---

<sup>1/</sup> All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service, U.S. Department of Agriculture.



## PLANNED PROJECT

Land Treatment: Landowners in the watershed are installing land treatment measures to protect the land from sheet and gully erosion. The project provides for a sound and effective land treatment program to be accelerated on the remaining farms needing treatment during the 4-year project installation period. Major practices planned to accomplish this are: Terraces, contour farming, grassed waterways, conservation tillage, and grade stabilization structures.

Technical assistance will be provided to landowners and farm operators for installation of land treatment measures. During the installation period it is estimated that an additional 630 acres of cropland, 250 acres of pastureland, and 94 acres of forest land will be adequately protected.



Terraces

Level terraces are earth embankments constructed across the slope with the channel and ridgetop built level. They are spaced to reduce erosion by shortening the length of slope available for runoff water. Runoff from a 10-year frequency storm is stored above these terraces. They are used on soils that allow infiltration of the stored water without damage. An estimated 3 miles will be installed.



Contour Farming

Contour farming is a method of farming which entails soil preparation, planting, cultivating, and harvesting along guidelines that are level or nearly level. Contour farming reduces soil erosion by slowing the speed of runoff waters. Downstream peak flows are reduced and more water is infiltrated into the soil. Contour farming will be established on an estimated 1,800 acres during the project installation period.





Grassed Waterways

Grassed waterways are shaped and vegetated drainageways established for the safe conveyance of runoff water.



### Conservation Tillage

Conservation tillage is the practice of planting crops with a minimum disturbance of previous crop residue and limiting the number of cultural operations which incorporate residue into the soil. The layer of crop residue dissipates energy from raindrops before they strike the soil surface, thus reducing erosion and permitting more water to infiltrate into the soil. Residues also disrupt ground level wind currents thereby reducing wind erosion and moisture loss. An estimated 100 acres will be installed during the installation period.

Other measures such as wildlife plantings for food and cover are an integral part of conservation planning. Three acres of food and cover plantings or habitat improvements will be installed on farms in the watershed.

Structural Measures: Structural Measures consist of nine grade stabilization structures. These structures inundate unstable gully heads and lower runoff waters from the upstream pool levels to the stable gully bottom through pipe spillways. They are planned to supplement land treatment measures by stabilizing upstream gullies and reducing downstream peak flows and sediment deposition.

All will be reservoir type structures constructed with earth available at the site. The foundations may extend into glacial till in the lower elevations of the watershed but may be entirely in loess soils at higher elevations. The principal spillways will be placed on yielding foundations of compacted fill. The earthfills will be constructed with 3 to 1 sideslopes and will be protected from wave action by level berms.

The principal spillways will be fabricated from corrugated metal pipe of 18-, 21-, or 24-inch diameter. The pipe will have an estimated life of 35 years and will be replaced as needed. Each principal spillway will have hood inlet and either a slotted flume or propped outlet. The outlets will be fabricated from corrugated metal pipe of the same diameter as the spillway.

The reservoirs formed by the structures will provide sediment storage and grade stabilization pools to reduce gully erosion. These pools will range in size from 2.9 acres to 15.2 acres.

During and after periods of rainfall or snowmelt runoff, the pools will rise to higher elevations. All the structures will have storage and principal spillway capacity to pass the runoff from a 25-year frequency storm. Runoff from storms of greater magnitude will flow through the vegetated emergency spillways. The maximum retarding pools will range in size from 5.3 to 30.3 acres.

This type of structure is illustrated in sketch SS-13 with a propped outlet and in figure 2 with a slotted flume outlet.

The grade stabilization pools will provide storage for a minimum of 50 years sediment accumulation. Six of the structures will have pool elevations governed by stabilization needs and provide more storage than is needed for sediment. The pools will be available as aquatic habitat for an estimated 40 years at 3 sites and ranging to 80 years and longer at the other 6 sites.

Runoff from 29 percent of the watershed area will be controlled by the structural measures.

All land which will be occupied by the structural measures will remain in private ownership. Required land rights will be secured by the sponsoring local organizations in the form of easements.

The present use of the land required for structural measures is presented in the following table.



## LAND USE SUMMARY

| Project<br>Land Use | Present Land Use in Acres |         |        |       |       |
|---------------------|---------------------------|---------|--------|-------|-------|
|                     | Cropland                  | Pasture | Forest | Other | Total |
| Permanent or        |                           |         |        |       |       |
| Sediment Pools      | 10.8                      | 31.9    | 6.1    | -     | 48.8  |
| Retarding Pools     | 22.6                      | 21.8    | 1.9    | -     | 46.3  |
| Dams & Spillways    | 12.8                      | 11.2    | 2.7    | -     | 26.7  |
| Total               | 46.2                      | 64.9    | 10.7   | -     | 121.8 |

Construction operations will be in compliance with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement. Noise, water, and air pollution caused by construction operations will be regulated by the following methods as needed:

1. Leaving the existing vegetation on work areas as long as possible.
2. Constructing debris basins.
3. Diverting runoff water from highly erodible areas.
4. Establishing temporary vegetative cover.
5. Controlling smoke during burning.
6. Suppressing dust on haul roads.
7. Scheduling operations so that unvegetated areas are not exposed over long periods of time.

The structures will be designed to minimize potential vector problems. Drains will be installed to eliminate seepy or marshy areas below the dams and surface drainage will be provided for all exposed borrow areas to aid in mosquito control.

All shrubs, trees, and stumps will be cleared and grubbed from the area to be occupied by and within 50 feet of the earthfill and spillways. The borrow areas and other construction areas will also be cleared and grubbed.

Cleared materials will be placed in neat, dense piles to provide cover for wildlife. Piles will be located above the emergency spillway crest elevation in locations agreeable to the affected landowner. The pile locations will be planned for maximum use by wildlife and to blend with the landscape.

Grasses and legumes will be established on and around the earthfills and earth spillways, and other areas disturbed by construction activities. Vegetative cover will control erosion and sediment production from these areas. It will also provide wildlife food and cover and esthetic values. Earthfills and spillway areas will be fenced as needed to protect them from overgrazing by livestock.

A reconnaissance study and report by the Iowa Conservation Commission recommends a minimum of 1½ acres be developed to mitigate the loss of habitat at structure L-2. Two acres will be available in the vicinity of L-2 and will be fenced and planted to wildlife food and cover plants.

If artifacts or other items of unique historic or archeological significance are discovered during construction of the project, the National Park Service will be notified through the State Archeologist and the State Historical Preservation Officer.

Operation and Maintenance: Operation and maintenance of the land treatment measures will be carried out by individual landowners or users as agreed upon in their conservation plans jointly developed with the Districts.

The structural measures will be maintained by the sponsoring local organizations. Montgomery County and Montgomery District will maintain structure L-3. Structures located in Page County will be maintained by that County and District. The structures will require no manipulation for their proper operation.

Maintenance cost is estimated to be \$1,210 annually. In accordance with Iowa law, the funds necessary for this work will be obtained from taxes levied on the agricultural land in each county. These taxes cannot exceed  $\frac{1}{4}$  mill per year.

Maintenance of the structures may include:

1. Replacing soil removed by erosion and rodents on earthfills and emergency spillways.
2. Re-establishing vegetative cover on earthfills, emergency spillways, and borrow areas.
3. Removing debris accumulations in sediment and retarding pools.
4. Keeping trash racks in proper working order.
5. Replacing or repairing damaged sections of the principal spillways.
6. Stabilizing the outlets of the principal spillways.
7. Removing undesirable vegetation from earthfills and emergency spillways.

Maintenance work will be done by mechanical means such as: Mowing, seeding, painting, and earthmoving. Chemical means to control vegetation will be used only where mechanical methods are not practical.

An annual inspection of the completed structural measures will be made by the sponsoring local organizations to determine maintenance needs. A copy of the findings of this inspection will be sent to the Soil Conservation Service. All components of the structural measures will be inspected. The Soil Conservation Service will participate in the inspections for

the first 3 years after a structure is completed. In addition to the annual inspections, inspections will be made soon after major storms or other unusual conditions that might adversely affect the structures. The Soil Conservation Service will participate in these inspections as deemed necessary.

The Soil Conservation Service will furnish technical assistance to aid in the inspection and design for maintenance and repair.

Operation and Maintenance Agreements setting forth all details in connection with responsibilities for operation and maintenance of structural measures will be executed prior to the signing of project agreements for construction.

Project Costs: Costs of the project are summarized in the following table:

|                        | <u>P.L. 566</u> | <u>Local</u> | <u>Total</u> |
|------------------------|-----------------|--------------|--------------|
| Construction           | \$185,060       | -            | \$185,060    |
| Engineering Services   | 36,970          | -            | 36,970       |
| Land Rights            | -               | \$19,850     | 19,850       |
| Project Administration | 27,730          | 1,850        | 29,580       |
| Structural Measures    | \$249,760       | \$21,700     | \$271,460    |
| Land Treatment         | -               | 27,990       | 27,990       |
| Project                | \$249,760       | \$49,690     | \$299,450    |



## ENVIRONMENTAL SETTING

Physical Resources: Pierce Creek No. 2 Watershed is located in extreme southwestern Iowa in Page and Montgomery Counties. It consists of 7,630 acres in Page County and 730 acres in Montgomery County for a total of 8,360 acres or 13.1 square miles. The watershed is approximately 7 miles long and has a maximum width of 3 miles. The eastern boundary of the watershed is the right bank of the East Nishnabotna River; Pierce Creek No. 2 has no main stream but consists of the drainage area of several right bank tributaries of the East Nishnabotna River. The East Nishnabotna River combines with the West Nishnabotna River to form the Nishnabotna River subregion of the Missouri River region as delineated by the Water Resources Council.<sup>1/</sup>

There are no cities located in the watershed. The city of Essex, population 770<sup>2/</sup>, is located across the river from the watershed. Job opportunities and a marketing center are available in the Omaha-Council Bluffs metropolitan center located 60 miles northwest of the watershed. Shenandoah, population 5,968<sup>2/</sup>, 6 miles south; and Red Oak, population 6,210<sup>2/</sup>, 16 miles north of the watershed, have experienced an influx of industry which provides job opportunities for area residents.

Resource problems in the watershed are damages to upland areas from gully erosion, floodwater damages to crops, and impaired drainage due to sediment accumulation in outlet drainageways that cross the East Nishnabotna River flood plain. Approximately 40 acres of crops are damaged nearly every year by floodwater. It is estimated that 5.4 acres are voided and 7.4 acres are depreciated by gully erosion each year.

The watershed is located in the Marshall soil association area. The soils are derived from the Wisconsin loessial deposits and Kansan glacial till. Loess covers most of the upland area with till outcrops on the lower part of the slopes. These soils, developed under tall grass prairie vegetation, are characterized by high levels of organic material. Marshall soils comprise about 45 percent of the association, Shelby 5 to 15 percent with Minden, Colo, Judson, and Nodaway and other minor soils occupying the rest of the area. Characteristics of and the relative location of these soils are shown on figure 27.

Marshall soils are well drained, rock free silty clay loams occurring on nearly level to steeply sloping uplands. Slopes are typically between 2 and 5 percent and range from 1 to 30 percent. The very dark brown surface layers may be completely removed by erosion. The subsoil is a moderately permeable dark brown silty clay loam. These slightly acid soils, pH 5.8 to 6.5, are extensively used from crop production.

<sup>1/</sup> Atlas to River Basins of the United States, United States Department of Agriculture, Soil Conservation Service, Washington, D.C., June 1970.

<sup>2/</sup> 1970 Census Data.

The moderately good to somewhat poorly drained Minden soils occurring on the broader level divides have slopes from 0 to 3 percent. They are rock free silty clay loams with a black surface soil and brown and gray subsoil. The subsoil has moderate permeability. Minden soils are medium acid with pH 5.6 to 6.5. They are used for crop production.

The Shelby soils are loams derived from glacial till. They occur on upland sideslopes with the typical slopes of 14 to 25 percent and have slopes ranging from 5 to 30 percent. They formed under prairie vegetation, have very dark brown surface soil and yellow-brown subsoil. The surface has good internal drainage and the subsoil moderately slow permeability. Shelby soils are strongly acid with pH from 5.1 to 6. The flatter slopes are used for crop production and the steeper slopes for pasture.

Judson soils are silty clay loam with good to moderately good drainage. The subsoil has moderate permeability. They are located at the foot of upland slopes on alluvial fans. The parent material of Judson soil is silty colluvium. Slopes range from 1 to 9 percent with typical slopes between 2 to 5 percent. The surface soil is very dark brown with dark brown subsoil. These slightly acid soils, pH 6.1 to 7.0, are generally used for cropland.

The poorly drained Colo soils are silty clay loams formed from alluvium. They are bottomland soils with typical slopes of 0 to 2 percent with a range of 0 to 5 percent. The subsoil is black to very dark gray with moderately slow permeability. The surface soil is black. These soils are slightly acid with pH range of 5.8 to 7.0. They are used for intensive row crop production. These soils are subject to flooding.

Nodaway soils are silty loams occurring on the bottomland. These soils formed from alluvium under forest vegetation. They have slopes of 0 to 2 percent, moderately good drainage, and are neutral with a pH 6.6 to 7. The surface soil is dark grayish brown and a lower soil varying from grayish brown to dark grayish brown. Nodaway soils have moderate permeability. Even though subject to flooding these soils are used for intensive row crop production.

The parent material for most of the soils is the Wisconsin loess. The source of this material was chiefly windblown silt from the Missouri River flood plain. The loess is variable both in color and composition due to the varying conditions under which it was deposited and distance from the source.

The deposit of loess varies widely in thickness due to erosion which has occurred since its deposition. The average depth is estimated to be 20 feet.

Underlying the loess is the Kansan till, a yellowish heterogeneous mixture of clay, silt fine sand, coarse sand, and boulders. It is firm

and compact. Where exposed, its surface is moderately loose; however, a few inches below the surface it is compact and hard; and if wet, it is tough and gummy. The till has been estimated to have an average thickness of 125 feet. Underlying the Kansan till is the Nebraskan drift, a very dense drift, which lies on Pennsylvanian limestone, shale, and sandstone. The topography is classed as mature. It is characterized by moderately wide, slightly rounded ridges with strongly sloping sideslopes and well defined alluvial valleys. The flood plain of the valleys which separate the main ridges account for a large part of the level land of the Marshall region.

Elevations reach their maximum in the northwest part of the watershed where they reach 1,190 feet above sea level. The lowest elevation, at the southeast end of the watershed, is 968 feet above sea level.

The climate of the watershed is of the extreme midcontinental type. Average annual precipitation is 33 inches with 24 inches occurring as rain during the months of April through September. Snowfall averages 26 inches annually.<sup>1/ 2/</sup>

January, the coldest month, has an average temperature of 24°F and July, the hottest month, an average temperature of 78°F. Average annual temperature is 52°F with recorded extremes of -29° and +112°F.<sup>1/ 2/</sup>

The average frost-free growing season is 162 days from mid-April to early October.

Runoff from periods of short duration excessive rainfall typical of the climate cause flooding and channel stabilization problems. The recorded maximum point rainfall at Omaha for various durations is as follows: 5 minutes, 1.0 inch; 15 minutes, 1.86 inches; 1 hour, 2.62 inches; 6 hours, 4.45 inches; and 24 hours, 7.03 inches.<sup>3/</sup> Rainfall intensity in inches per hour is shown in the following table.

<sup>1/</sup> Climatic Summary of the United States - Supp. for 1931 through 1952, U.S. Department of Commerce, Weather Bureau.

<sup>2/</sup> Climatological Data-Annual Summaries 1953 through 1972 - U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

<sup>3/</sup> Technical Paper No. 2 - Maximum Recorded U. S. Point Rainfall - U.S. Department of Commerce, Weather Bureau.



Rainfall Intensity - Inches per Hour<sup>1/</sup>

| Duration  | Frequency - Years |      |      |      |      |      |
|-----------|-------------------|------|------|------|------|------|
|           | 2                 | 5    | 10   | 25   | 50   | 100  |
| 5 minute  | 4.5               | 6.0  | 7.0  | 8.2  | 9.2  | 10.0 |
| 15 minute | 2.9               | 4.0  | 4.8  | 5.6  | 6.5  | 7.1  |
| 1 hour    | 1.3               | 1.7  | 2.2  | 2.7  | 3.0  | 3.4  |
| 6 hours   | 0.32              | 0.47 | 0.58 | 0.70 | 0.80 | 0.89 |
| 24 hours  | 0.12              | 0.15 | 0.17 | 0.22 | 0.25 | 0.28 |

Subeconomic coal resources underlie the area.<sup>3/</sup> Some sand and gravel have been produced from alluvium in the river flood plain near the watershed. No other mineral resources of economic importance are known.

The principal supply of ground water is in shallow, unconsolidated alluvial deposits. This aquifer is the principal source of domestic and livestock water. On the East Nishnabotna River flood plain this water is of good quality and adequate supply. In the higher parts of the watershed the supply is inadequate during periods of extended drought.<sup>2/</sup>

Land use in the watershed is as follows:

| <u>Land Use</u> | <u>Acres</u> | <u>Percent</u> |
|-----------------|--------------|----------------|
| Cropland        | 6,271        | 75             |
| Pasture         | 1,471        | 17             |
| Forest land     | 58           | 1              |
| Other           | <u>560</u>   | <u>7</u>       |
| Total           | 8,360        | 100            |

Crops are cultivated for grain production and livestock feeding. Natural plant communities have been destroyed except for woodlands adjacent to streams. These communities will probably remain in the same successional stage because of extensive agricultural activities in the area.

Surface water resources in the watershed are limited to eight ponds constructed by farmers for gully control or livestock water.

The main drainage of the watershed is southeasterly. It consists of several laterals that drain directly into the East Nishnabotna River. Approximately 2 miles of modified channel are in the East Nishnabotna River flood plain, the remainder is natural channel. Flow conditions are classified as ephemeral on all laterals.

Plant and Animal Resources: Small, ephemeral streams provide no fishery because of low water levels, or the lack of water, throughout much of

<sup>1/</sup> Technical Paper No. 25, Rainfall Intensity-Duration-Frequency Curves, U.S. Department of Commerce, Weather Bureau.

<sup>2/</sup> An Inventory of Water Resources and Water Problems, Nishnabotna River Basin, Iowa, Bulletin #2, Iowa Natural Resources Council - 1955.

<sup>3/</sup> Coal Resources of Iowa, Iowa Geological Survey Technical Paper 4, 1965.

the year. Eight privately owned farm ponds in the watershed provide a sport fishery of channel catfish and largemouth bass.

The upland portion of the watershed contains some good upland wildlife habitat. Small scattered tracts of woody cover, composed mainly of elm, oak, maple, and cottonwood trees, are found in conjunction with drainageways. The watershed contains a high density of cottontail rabbit and coyote; moderate density of fox squirrel, pheasant, and quail; and a low density of red fox, waterfowl, and whitetail deer.<sup>1/</sup>

Utilization of the fish and wildlife in this watershed by sportsmen is generally limited to local residents. Access is through private property.

Economic Resources: All land within the watershed is privately owned except for transportation rights-of-way.

The major farm enterprise in the watershed is the feeding of livestock. Other types of farming include cash grain such as corn and soybeans with some oats and hay. Crop yields average 120 bushels of corn and 37 bushels of soybeans per acre. Corn acreage has remained about the same in Page County from 1964 to 1969. Total production during this time has increased approximately 50 percent because of increased yields.<sup>2/</sup> The most significant change in the row crop pattern has been the increase of soybean acreage and yields between 1964 and 1969. Soybean acreage has increased 26 percent to 48,181 acres while production has increased 77 percent.<sup>2/</sup> This trend is important since most of the increased soybean acres represent a change to row crop from some non-row crop use such as oats or wheat.

There are 54 farms located entirely or partially within the watershed. Approximately 52 percent of the farms are owner-operated. The average size farm in Page County is 260 acres.

The average value of land in Page County is \$320 per acre.<sup>3/</sup> According to information from local people the land included in this watershed would exceed this value at least 50 percent.

Adequate transportation facilities are available to the watershed. County Highway H traverses the center of the watershed in a north-south direction. County Highway M passes through the watershed in an east-west direction. State Highway 48 is located just outside the watershed boundary. The Burlington Northern Incorporated railroad is located adjacent to State Highway 48.

Both counties in the watershed have a decreasing population. Approximately 12 percent of the population was lost from 1960 to 1970.

<sup>1/</sup> Iowa Conservation Commission Data, 1970. Based on high, moderate, low, and infrequent scale.

<sup>2/</sup> 1964 and 1969 Census of Agriculture.

<sup>3/</sup> 1969 Census of Agriculture.



The median annual family income is \$7,194 in Page County. This compares with the state median of \$9,018.<sup>1/</sup>

The following information is indicative of trends in agriculture in Pierce Creek No. 2 Watershed. Average value per acre of farmland increased 54 percent from 1964 to 1969. The average size of farm in Page County increased with most of the growth occurring in farms between 500 and 999 acres in size. There was no increase in the number of farms over 1,000 acres.

The number of tenants in Page County decreased by 26 percent from 1964 to 1969. The average age of farm operators dropped 0.3 year, from 51.4 to 51.1 years of age.<sup>2/</sup>

About 43 percent of all the farmers in Page County had some off-farm employment. An increase of 22 percent in off-farm employment occurred from 1964 to 1969.<sup>2/</sup>

Local employment opportunities were discussed with the Chambers of Commerce of Red Oak and Shenandoah. The Red Oak office reported approximately 400 new jobs have been created in new and expanded industries in the past year. They also reported that an additional 200 jobs will be created when these industries begin operating at full capacity. The office at Shenandoah reported approximately 400 jobs have been created in two new and several expanded industries within the past 5 years.<sup>3/</sup>

Unemployment statistics for Shenandoah show an unemployment rate of about 3.7 percent for 1971 and the first 6 months of 1972. This is indicative of job opportunities for the area.<sup>4/</sup>

Soil, Water, and Plant Management Status: The trend of land use in Page County from 1964 to 1969 has been to convert other land uses to cropland. Cropland has increased 15 percent, pasture decreased 43 percent, forest land decreased 2 percent and other uses decreased 5 percent.<sup>5/</sup> This trend is expected to continue in the watershed until approximately half of the present pasture is converted to cropland.

Both Page and Montgomery Counties have active soil conservation district programs. Montgomery district was established in 1940 and Page County district in 1941. Both are active in all phases of soil and water conservation.

<sup>1/</sup> 1970 Census data.

<sup>2/</sup> 1969 Census of Agriculture.

<sup>3/</sup> Letters from Chambers of Commerce of Red Oak and Shenandoah, Iowa.

<sup>4/</sup> Unpublished Special Report - Iowa Employment Service.

<sup>5/</sup> 1964 and 1969 Census of Agriculture.

Conservation land treatment valued at \$109,590 has been applied in the watershed with an additional \$27,990 planned as part of the project. Presently, 2,795 acres of cropland, 1,471 acres of grassland, 58 acres of forest land, and 274 acres of other land is considered adequately protected.

Of the 54 farms wholly or partially within the watershed, 30 are under district agreement and conservation plans have been developed on 27. Seventy-three percent of the watershed is covered by district agreements and 63 percent is covered by conservation plans.

The State of Iowa, through the Department of Soil Conservation, cost shares with landowners for soil conservation practices.

Recreational Resources: There are no public recreational facilities in the watershed; however, there are 2 state parks within 25 miles. One has picnicking, boating and fishing while the other offers picnicking, nature hikes, and sightseeing.

Archeological and Historical Resources: Soil Conservation Service field studies indicate no places of archeological or historical value within the watershed. No sites are listed in the National Register of Historic Places or Outdoor Recreation in Iowa. Consultation with the State Historic Preservation Officer revealed one site in the county outside the watershed area has been reported. A study of the area indicated that construction of the structures contained in the plan will not cause any loss of Archeological or historical values.<sup>1/</sup>

#### WATER AND RELATED LAND RESOURCE PROBLEMS

Erosion Damage: The annual estimated sediment production from all upland in the watershed is 42,300 tons; this is equivalent to 6.6 tons per acre per year.

Gross annual sheet and rill erosion rates average: Cropland 3.5 tons per acre, grassland 2.1 tons per acre, and forest land 1 ton per acre. These average erosion rates do not degrade land quality beyond tolerable limits. Approximately 1,432 acres have erosion rates high enough to cause a decline in production by removal of fertile top soil. Sheet and rill erosion provides an annual average of 14,600 tons of sediment to the East Nishnabotna River. Average annual sediment yield from cropland is 2.1 tons per acre and from grassland and forest land 1 ton per acre.

Gully erosion provides an estimated 27,700 tons of sediment per year or 4.3 tons per acre per year from the erodible upland area of the watershed.

Gully erosion contributes to the degradation of productivity of cropland and pasture in several ways. Land destroyed by voiding is lost to production and much of the area adjacent to the gully depreciates to a less intensive use.

<sup>1/</sup> Unnamed study report of archeological and historical resources of Pierce Creek No. 2 Watershed by Sylvan T. Runkel, Environmental Consultant.

It is estimated that gully erosion above planned structures will void 270 acres and 370 acres of land will be depreciated to a lesser use during the next 50 years. Income will be lost on 270 acres and reduced on 370 acres. As gullies get deeper and wider the cost of maintaining fences and farm crossings will increase. These fences and farm crossings will eventually be abandoned. Wildlife habitat along the upland drainageways will disappear due to land voiding.

The total estimated damage of \$19,290 per year is caused by gully erosion.

Sediment Damage: Sediment deposition in the drainage ditches reduces capacity and causes flooding. It also impairs subsurface drainage of the adjoining land. Cost of sediment cleanout to maintain capacity and depth of the outlet drain below structure site K-1 is \$1,500 annually.

Floodwater Damage: Floodwater damage occurs nearly every year to crops on the flood plain below structure site J-2. The floodwater damage consists of complete or partial loss of crops, reduction of yields and delay of tillage operations. If operations are sufficiently delayed, lower value crops are substituted. Two landowners are affected by flood damages.

The flood plain is subject to flooding at any season of the year with 98 percent of the floods occurring during the growing season. Flooding begins at the 1.3 year frequency and all floods cover the entire 40 acre flood plain. It is intensively cropped to corn and soybeans and this use is expected to continue.

The average annual floodwater damage to crops is \$920.

Plant and Animal Resource Problems: The monoculture of crop production results in a similarity of habitat that restricts wildlife to those adaptable species. This results in high populations of a few species such as rabbit and coyote. There is enough diversity to maintain populations of other wildlife species at a lower level. Wildlife populations are expected to remain stable or decline unless more diversity of habitat is created.



## RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

The Page County and Montgomery Soil Conservation Districts with assistance of the State Department of Soil Conservation established soil loss limits for each county.

The only known future plans are State land use regulations being discussed in the present legislature.

There are no other known Federal, State, or local land use plans, policies, or controls in existence.

## ENVIRONMENTAL IMPACTS

Conservation Land Treatment: Planned land treatment measures will increase the area adequately protected from erosion to 66 percent compared with 55 percent without the project. This is an increase of 974 acres.

Land treatment measures will reduce sheet and rill erosion as shown in the following table.

| <u>Land Use</u> | <u>Average Annual Gross Sheet and Rill Erosion</u><br><u>Tons/Acre/Year</u> |                     |
|-----------------|---|---------------------|
|                 | <u>Without Project</u>  | <u>With Project</u> |
| Cropland        | 3.5   | 2.7                 |
| Pasture         | 2.1   | 1.0                 |
| Forest          | 1.0   | 1.0                 |

Crop production can be expected to increase on the acres which will be treated. Sheet erosion causes a loss of plant nutrients and pesticides since many of these chemicals become attached to soil particles. Yields will be higher for a given level of chemical treatment when sheet erosion is reduced.

Terraces will permit a more intensive use of the cropland. More corn and soybeans will be grown instead of small grains, grasses, and legumes. Farm operating costs will be reduced when small fields dissected by gullies are joined by grassed waterway construction.

Sediment produced by sheet and rill erosion which enters the East Nishnabotna River will decrease by 5400 tons per year after installing the land treatment measures.

The grassed backslopes of terraces will occupy about 3 acres which will be converted from cropland to grass. These grass strips will provide nesting areas and travel lanes for terrestrial wildlife.

As grassed waterways are constructed in the gullied areas the existing forms of wildlife will be disrupted. However, waterway areas approximately equal in size will be re-established in grass and legumes.

The elimination of many of the deep gullies will reduce injury and death loss for livestock. The physical risk to farmers in operating machinery along the gullies will also be eliminated.

Structural Measures: The structures will prevent gully erosion damage to 640 acres during the 50-year evaluation period. If the gullies are not stabilized, 270 acres will be voided and 370 acres depreciated from their present use. This is equivalent to losing 1 average size farm and decreasing income on 1.4 average size farms. The average annual land damage will be reduced 95 percent. Gully erosion damage to 9 boundary fences and 3 farm crossings will be reduced 95 percent. Thirty farmers will benefit from reduced gully erosion.

Flooding on 40 acres of bottom land will be reduced from the present frequency of 1.3 years to 6 years. The total flood plain is covered whenever flooding occurs; however, the depth and duration of flooding is less for the frequent floods. With the project installed the depth of flooding will be reduced for all floods. The flood plain is presently used for corn and soybean production and this use is expected to continue. Floodwater damage to crops will be reduced 96 percent. Two farm families will be benefited by the reduction of these damages. Reduction of the floodflows will reduce highway replacement and maintenance costs by an estimated \$2,290 annually. Two bridges may be replaced with culverts. Road maintenance costs will be reduced at three locations.

The structures will accumulate sediment at the rate of 7.6 acre-feet per year. Storing this sediment will decrease the amount available for deposition in stream channels on the East Nishnabotna River flood plain. Channel capacity for floodflows and channel depth for drainage will be maintained for longer periods and cleanouts will be reduced. These damages on 430 acres on 5 farms will be reduced 90 percent.

Sediment entering the East Nishnabotna River from the watershed follows. .

| Sediment                |                          |                                  |                          |
|-------------------------|--------------------------|----------------------------------|--------------------------|
| Source                  | : Present<br>: Tons/year | : With Project :<br>: Tons/year: | Reduction<br>: Tons/year |
| Sheet & rill<br>erosion | 14,600                   | 9,200                            | 5,400                    |
| Gully erosion           | 27,700                   | 2,200                            | 25,500                   |
| Total                   | 42,300                   | 11,400                           | 30,900                   |



Sediment entering the East Nishnabotna River from the watershed will be reduced from 42,300 tons to 11,400 tons annually.

Sediment produced from sheet erosion contains pesticides and plant nutrients. By reducing the amount of this sediment leaving the watershed a corresponding reduction will be made in the amount of pesticides and plant nutrients leaving the area.

Studies<sup>1/</sup> of agricultural runoff water show that pesticides reach Iowa streams both as soluble material and through adsorption on soil particles which make up much of the sediment in Iowa rivers. In this study, approximately 50 percent of the pesticide load was carried by the sediment which gradually settles to the bottom and remains there for extended periods.

Agricultural chemicals are used for cropland fields that are 75 percent of Pierce Creek No. 2 Watershed. Amount of agricultural chemicals leaving crop fields are variable and data are not available on levels entering the East Nishnabotna River. However, 30,900 tons of sediment will be prevented from entering the East Nishnabotna River annually by the planned project. This will result in reduced levels of agricultural chemicals leaving the watershed.

The structures will initially provide 48.8 acres of water. These pools in a watershed area with eight small farm ponds will increase the aquatic habitat significantly. The addition of water areas and their fringes will create additional ecological niches in the watershed ecosystem. The diversity supplied from the creation of these niches will have a stabilizing effect by making the food web more complex and less sensitive to perturbation. The landowner or farm operator on whose land the pool is located may stock it with fish. All sites were evaluated to determine their potential for public recreation. Public recreation as a purpose was abandoned when it was determined that none of the sites could be developed for any significant amount of recreation. Public access will not be provided at any of the sites. Outdoor recreation in the form of hunting and fishing in the watershed area has traditionally been supplied by private landowners. Since the limited recreational opportunity associated with the project is not enough to attract a new or different public, there is no reason to believe that it will not be made available as other private lands have been in the past. These pools will be in existence for about 40 years at 3 of the sites and for 80 years or longer at the other 6.

Installation of the structures will result in the loss of 9.4 percent of forest land, 0.4 percent of cropland, and 3.3 percent of the pastureland. Crop production on 10.8 acres, pasture production on 31.9 acres, forest production on 6.1 acres, and terrestrial wildlife on 48.8 acres will be lost to the pools. The dams and spillways will cause the loss of crop production on 12.8 acres, pasture production on 11.2 acres, and forest production on 2.7 acres and will temporarily interrupt wildlife

1/ Chlorinated Hydrocarbon Pesticides in Iowa Rivers. Pesticides Monitoring Journal, 4 (4): 216-219, 1971.

Dieldrin Levels in Fish from Iowa Streams. Pesticides Monitoring Journal 5: 12-16, 1971.

Pesticides and Heavy Metals in the Aquatic Environment. Health Laboratory Science, Vol. 9, No. 2, April 1972.

use of 26.7 acres. After these areas are revegetated they will be available as grassland habitat for wildlife use.

Floodwater in the retarding pools of the structures can result in reduction of crop yields on 22.6 acres, interruption of pasture use on 21.8 acres, and interruption of wildlife use of 46.3 acres. About 4 miles of ephemeral stream channel will be flooded by the pools of the structures and the wetland habitat in these channels modified.

A water supply will be created that will be available for livestock consumption and firefighting.

Four of the structures will be located close to farmsteads and the noise of construction operations will be bothersome. The noise at the other structures should not bother people because of the distance of their homes from the sites.

Dust from construction operations will get into the atmosphere; however all possible precautions will be taken to minimize the amount of airborne soil particles.

#### FAVORABLE ENVIRONMENTAL EFFECTS

1. Reduce sheet and rill erosion 26 percent.
2. Prevent loss through voiding of 270 acres of land and depreciation of 370 acres by gully erosion on 30 farms.
3. Reduce gully erosion damages to nine boundary fences and three farm gully crossings.
4. Reduce sediment entering the East Nishnabotna River by 30,900 tons annually.
5. Reduce average annual floodwater damages on 2 farms on 40 acres by 96 percent.
6. Increase income to farmers.
7. Reduce county highway maintenance cost.
8. Provide 48.8 acres of aquatic habitat.
9. Provide resting areas for migratory waterfowl.
10. Provide water for firefighting and livestock.



### ADVERSE ENVIRONMENTAL EFFECTS

1. The ecological community in 4.0 miles of ephemeral channel will be modified by inundation.
2. Crop production will be lost on 11 acres, pasture production lost on 32 acres and forest production lost on 6 acres due to inundation by water.
3. Floodwater in the retarding pools will result in temporary interruption of pasture use of 22 acres, decreased crop yields on 23 acres, and temporary interruption of wildlife use of 46 acres.
4. The construction of dams and spillways will result in the loss of production on 13 acres of cropland, 11 acres of pastureland, and 3 acres of forest land.
5. Terrestrial wildlife use will be lost on 48.8 acres.
6. Noise and dust during construction operations will affect four farmsteads.

### ALTERNATIVES

The alternative to the planned project is no project. Conservation land treatment measures would continue to be installed under the program of the Soil Conservation Districts. Crops on 40 acres of flood plain will continue to be damaged almost every year. Over the next 50 years 270 acres will be voided by gullies and 370 acres will be depreciated to a lesser use. As the gullies get deeper and wider the cost of maintaining or trying to maintain fences and farm crossings will increase until they are abandoned. This will require longer travel distances and more road travel with farm equipment creating traffic hazards. Much of the wildlife habitat along the upland drainageways will disappear due to land voiding. Income from 270 acres will be lost and decreased on 370 acres. The esthetics of the area will be downgraded by the raw eroding gullies in crop and pastureland. Sediment will deposit in the channels on the East Nishnabotna River flood plain requiring periodic cleanouts to maintain capacity for floodwater and depth for drainage. This sediment is usually deposited in unsightly spoil banks. The land that will be used for the pools of the structures would be available for wildlife and agricultural use until it was either voided or depreciated. Net annual monetary benefits of \$5,100 will be foregone if the project is not implemented.

### SHORT-TERM VS. LONG-TERM USE OF RESOURCES

Pierce Creek No. 2 Watershed is now dedicated almost entirely to agricultural production. It is not expected that present uses of the land will undergo any radical change in the foreseeable future. The project planned for Pierce Creek No. 2 Watershed will reduce flooding, reduce



damages from sediment deposition and gully erosion problems for the watershed over the next 50 years. Options available for long-term use within the watershed will not be materially affected by the planned project. The preservation of the land without extensive areas scarred by large gullies will tend to hold more options open to the public in the future.

The project will be compatible with any long-term use plans that are developed for the area because the reduction of flooding, prevention of gully development, and reduction of sedimentation in stream channels will enhance any plans developed for the area.

The project will continue to be effective in reducing floods, stabilizing gullies and reducing sedimentation long after its economically evaluated 50-year life. Floodwater reduction will continue until sediment has significantly reduced the volume of the temporary storage pools. With proper maintenance the grade stabilization structures will be effective indefinitely.

Pierce Creek No. 2 Watershed will join three other watersheds currently in the operation stage in the lower reaches of the East Nishnabotna River tributary of the Nishnabotna River. Three other P.L. 566 watersheds are in the operation stage in the upper reaches of the East Nishnabotna River and another watershed was determined not to be economically feasible. Four P.L. 566 watersheds are completed on the West Nishnabotna River and two watershed applications have been approved by the State Soil Conservation Committee on the West Nishnabotna River. While much of the area that is drained by the Nishnabotna River is still uncontrolled by project type action, the cumulative effect of these watersheds will be to reduce the sediment load carried by the river. The Nishnabotna River has long been notorious as one of the heaviest sediment laden rivers in the state. Any reduction in the sediment load carried by the Nishnabotna River will have a beneficial effect on any water resource development planned for the river. The Omaha District Office, Corps of Engineers, has consistently stated that upstream watershed projects planned by SCS are compatible and beneficial to developments they plan along the streams in this area of the state (figure 3).

### IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Eleven acres of cropland, 32 acres of pastureland, and 6 acres of forest land will be committed to permanent inundation by the project. Twenty-three acres of cropland, 22 acres of pasture, and 2 acres of forest will be periodically inundated in the temporary pools of the structures. Thirteen acres of cropland, 11 acres of pasture and 3 acres of forest will be committed to dams and spillways. The land dedicated to inundation by permanent water will be lost to other uses. The water will gradually be replaced by sediment during and after the economic life of the project. This area will become a marshy, semi-aquatic environment and will be available for wildlife use after the economic life of the project. The area dedicated to dams, spillways and temporary storage will be lost to agricultural production. Once construction is completed and the disturbed areas are revegetated, it will become available for wildlife and recreational use. While in the strictest sense the areas will not be irreversibly and irretrievably committed, a pragmatic viewpoint would concede that they will not be available for development within the foreseeable future.

The required capital of \$299,450 will also be committed.

### CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

The State Department of Soil Conservation received an application for P.L.566 assistance for Pierce Creek No. 2 Watershed on March 10, 1967. It was approved by them on May 1, 1967. The Administrator of the Soil Conservation Service authorized planning assistance for this project on October 5, 1970.

Various State and Federal agencies have received information in regard to the status of this plan.

The State Archeologist, State Historic Preservation Officer, and the Midwest Archeological Center of the National Park Service are kept informed of the watershed program through progress reports. They arrange for survey and salvage work when watershed construction activities appear imminent in places of potential archeological or historical value. They are notified of the planning of specific projects and are asked to review the work plan and environmental impact statement.

The fish and wildlife aspects of this watershed plan were developed in consultation with the U.S. Department of the Interior, Bureau of Sport Fisheries and Wildlife, and the Iowa Conservation Commission.

A public information meeting was held on February 17, 1972. Each individual structure that was studied was reviewed. After this meeting four structures were dropped from the project. This was in agreement with the local people. Local landowners and operators, employees of the Iowa Conservation Commission and SCS employees from State, Area and District offices were in attendance at this meeting.

Summary of Comments and Response on  
the Draft Plan and Draft Statement

The following agencies acknowledged the plan and environmental impact statement with no comment:

Governor of Iowa (Department of Soil Conservation)  
State Clearinghouse (Office for Planning and Programming)  
Iowa Department of Environmental Quality  
Iowa State Highway Commission  
United States Department of Health, Education and Welfare  
United States Department of Transportation

Comments received from the following agencies and the responses are as follows:

Iowa State Historic Preservation Department

Comment 1: "Executive Order 11593 has not been effected."

Response: Lands in the project area are not federally owned. Executive Order 11593 applies primarily to lands owned or controlled by the federal government.

Comment 2: "If sites are found, Federal administration procedures (36 CFR 800) must be followed to insure proper consideration of the resources."

Response: No sites are expected to be uncovered by project construction. In the event one is discovered, the National Park Service, State Archeologist, and State Historic Preservation Officer will be notified. Soil Conservation Service policy and procedures conform to all existing regulations and preclude the loss of sites of local or national significance without proper evaluation and mitigation of adverse impacts.

Comment 3: "There have been no professional surveys done for the area."

Response: A survey of the area was contracted for and made by Mr. Sylvan T. Runkel, environmental consultant. Results of this study are noted on page 16 of the EIS.



Advisory Council on Historic Preservation

Comment 1: "Compliance with Executive Order 11593 of May 13, 1971

1. In the case of land under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will result in the transfer, sale, demolition, or substantial alteration of potential National Register properties. If such is the case, the nature of the effect should be clearly indicated.

Response: None of the land is under the control or jurisdiction of the Federal Government

Comment 2: "Compliance with Executive Order 11593 of May 13, 1971

2. In the case of lands not under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will contribute to the preservation and enhancement of non-federally owned districts, sites, buildings, structures, and objects of historical, archeological, architectural, or cultural significance."

Response: A statement has been added to the Plan and Environmental Impact Statement that construction of the project structures will not cause any loss of archeological or historical values. As noted on page 8, however, if anything of value is discovered during construction, proper procedures have been established to insure their preservation.

Department of the Army, Corps of Engineers

Comment 1: "A comparison of the benefits and costs for structural measures on page 36 shows the benefit-cost ratio for structure H-1 is slightly more than 1.0 based on an interest rate of 5-5/8 percent. Applying the current interest rate of 5-7/8 percent to the economic analysis on structure H-1 would yield a benefit-cost ratio of slightly less than unity. Application of the current interest rate to the total project would not significantly affect the project benefit-cost ratio."

Response: The estimated annual cost of structure H-1 updated to present day costs at 5-7/8 percent interest is \$1,560. The estimated annual benefits updated to present day agricultural commodity values is \$1,700. The benefit cost ratio is 1.1 to 1.0.

Comment 2: "Page 1 of the Work Plan states that approximately 40 acres of cropland are damaged each year by flood waters whereas Page 1 of the Draft Environmental Impact Statement indicates 20 acres."

Response: Page 1 of the Environmental Impact Statement has been corrected to read 40 acres.

Comment 3: "Also, page 7 of the Draft Environmental Impact Statement states that grasses and legumes to be planted will provide cover and food for wildlife. We feel that it would be desirable to indicate what kinds of grasses and legumes would be planted."

Response: Grasses and legumes will be selected by the Soil Conservation Service Agronomist and Biologist when the structures are constructed. First consideration will be to develop vegetative cover to prevent erosion. Wildlife needs will be considered next. Presently nesting cover for wildlife is the greatest need. Actual need at time of selection will dictate the choice of plants. Selecting the plants to be planted at this time would be presumptive.

#### United States Department of the Interior

Comment 1: "...the two acres designated as wildlife mitigation... should be identified on a map in the final Environmental Impact Statement so its relationship to the retarding pool can be ascertained...to assure accomplishment of loss mitigation measures."

Response: The area for mitigation measures cannot be identified until land rights for structure L-2 have been obtained and the final location can be made. This area will be in the immediate vicinity of the pool and above the elevation of flooding from the 5 year frequency storm.

Comment 2: "The final statement should provide assurance that if the scheduled archeological and historical investigation of the project area should reveal the presence of cultural resources now unknown, such resources will be carefully identified, expected project effects on them analyzed, and an appropriate program developed to avoid or mitigate adverse effects."

Response: The investigation indicated that projection would cause no loss of cultural values. As previously noted, however, if such values were discovered during construction, procedures have been set up to insure their preservation.

Comment 3: "Because of the financial and technical assistance provided by the Federal Government on these non-Federal lands under Public Law 566, it is essential that recreational use of these resources be maximized to the degree that they are compatible with the landowner's farming operation. That is to say that limited forms of recreation such as hunting and fishing should not be arbitrarily denied the public. A need for public recreation for the area is also identified on page nine, under Recreation Resources.

The above is directed at the following quoted statement that appears on page 23 of the Work Plan, and page 20 of the Environmental Impact Statement.

The landowner or farm operator on whose land the pool is located may stock it with fish. None of these pools are adequate to support public recreation, therefore access will be at the discretion of the landowner. Limited recreational opportunities in the form of hunting, fishing, swimming, picnicking, and nature study will be available at these sites. These pools will be available for limited recreation for about 40 years at 3 of the sites and for 80 years or longer at the other 6. (Underlining added.)

It is confusing as to what this statement really is saying because having recreational opportunities available at these sites is of no value to the public if the landowner denies access. The subject statement should be clarified."

Response: This section of the Plan and Environmental Impact Statement has been rewritten.

Comment 4: "We recommend that qualified personnel determine the significance of the coal resource that would be lost under proposed dams and flood pools. Results of the investigation should be noted in the revised environmental statement and work plan in a brief statement describing the effect of the project on mineral resources and industry."

Response: Inclusion of the effects of the project on mineral resources and industry was not considered necessary. As stated in the EIS, the coal resource is now sub-economic. This is the only mineral resource that could be affected by the project. If future energy requirements or technological developments make the coal exploitable, the small size and areal extent of the structures would not hinder this exploitation.



United States Environmental Protection Agency

Comment 1: "The information on present and future water quality should include evaluation of anticipated turbidity and pesticides and nutrient concentrations in the impounded waters."

Response: Pierce Creek No. 2 Watershed is located on the eastern boundary of Pierce Creek No. 1 Watershed. Pierce Creek No. 1 has 8 impoundments constructed from 1964 to 1972. Soils, land use, and other factors affecting water quality are generally the same for both areas. The impoundments already installed in Pierce Creek No. 1 Watershed have had no problems with algae growth, odor, or vectors. None are anticipated in Pierce Creek No. 2 Watershed.

Comment 2: "The final Environmental Impact Statement should include a statement that rule 4.3(2)c (limitation of fugitive dust emissions) of the Iowa Environmental Quality Department Regulations will be adhered to during construction activities."

Response: The Environmental Impact Statement states that "Construction Operations will be in compliance with all applicable Federal, State, and local laws and regulations concerning environmental pollution." This would include applicable portions of rule 4.3(2)c.

Comment 3: "A clarification of how upland gully erosion will be avoided by the structural methods proposed should be included in the final statement so that interested persons may understand the functioning of the retention structures."

Response: Concur. An explanation of the functioning of the grade stabilization structures was added to the Environmental Impact Statement under the Structural Measures portion of the Planned Project section.

Comment 4: "The final statement should discuss future sediment control when sedimentation of these proposed control structures occurs."

Response: This is adequately discussed in the Short Term vs. Long-Term Use of Resources section of the Environmental Impact Statement.

Comment 5: "Other feasible alternatives such as land treatment measures without the structural measures should also be included in the Environmental Impact Statement and evaluated as an alternative to the proposed action."

Response: "No project" is the only feasible alternative to the structural measures proposed. Land treatment without structures is discussed as a part of the no project alternative.

Comment 6: "The impact statement indicates the proposed plan is compatible with developments planned by the Omaha District Corps of Engineers for the Nishnabotna River. The effects of this project should be analyzed in light of planned Corps projects in order to fully assess total impacts of Federal projects on the Nishnabotna River Basin."

Response: No Corps projects for the Nishnabotna River Basin are now in active planning. If such plans are developed, reduction of erosion and sediment production will be compatible and beneficial. In the case of Pierce Creek No. 2 watershed, this benefit would be only in principle since the effect on the River Basin on control on this small area would be so slight as to be immeasurable.


Appendix A - Comparison of Benefits and Costs for Structural Measures from the work plan.

Appendix B - Letters of comment received on Draft Environmental Impact Statement.

Appendix C - Sketch SS-13 and Figures 2, 3, and 27.

Appendix D - Project Map.

APPROVED BY

  
Wilson T. Moon  
State Conservationist

DATE

3-19-75



COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Pierce Creek No. 2 Watershed, Iowa

(Dollars)

| Evalua-<br>tion<br>Unit   | Struc-<br>tural<br>Measures | AVERAGE ANNUAL BENEFITS <sup>1/</sup> |                        |        | <sup>1/</sup><br>Average<br>Annual<br>Cost | Benefit<br>Cost<br>Ratio |
|---------------------------|-----------------------------|---------------------------------------|------------------------|--------|--|--------------------------|
|                           |                             | Damage<br>Reduction                   | Secondary:<br>Benefits | Total  |  |                          |
| 1                         | H-1                         | 1,400                                 | -                      | 1,400  | 1,390                                      | 1.0 to 1.0               |
| 2                         | J-1, J-2                    | 3,630                                 | 90                     | 3,720  | 2,800                                      | 1.3 to 1.0               |
| 3                         | J-4, J-5,<br>J-6            | 5,940                                 | -                      | 5,940  | 4,620                                      | 1.3 to 1.0               |
| 4                         | K-1                         | 2,550                                 | -                      | 2,550  | 1,440                                      | 1.8 to 1.0               |
| 5                         | L-2, L-3                    | 9,020                                 | -                      | 9,020  | 5,500                                      | 1.6 to 1.0               |
| Project<br>Administration |                             | XX                                    | XX                     | XX     | 1,780                                      | XX                       |
| TOTAL                     |                             | 22,540                                | 90                     | 22,630 | 17,530                                     | 1.3 to 1.0               |

<sup>1/</sup> Price Base - Agricultural prices, November 1973, for benefits;  
costs from Table 4.

In addition, it is estimated that land treatment measures will  
provide flood damage reduction benefits of \$160.00 annually.

Date: April 1974



STATE OF IOWA

# Office for Planning and Programming

523 East 12th Street, Des Moines, Iowa 50319 Telephone 515/281-3711

BERT D. RAY  
GovernorBERT F. TYSON  
Director

September 16, 1974

Wilson T. Moon  
State Conservationist  
U. S. Department of Agriculture  
Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309

ATTN: Charles R. Cobb

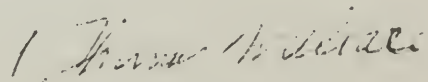
PNRS: 750011 - Work Plan and Draft EIS  
for Pierce Creek No. 2 Watershed

Dear Mr. Moon:

We have received the copies of the EIS for the Page and Montgomery Counties watershed along with Pierce Creek, which you sent us for review by the State Clearinghouse. Our records indicate that we did send the same material out for review by the state agencies in July of this year when we received the notice of a hearing on the project. I am attaching a copy of the clearance form and the comments that were received from two state agencies concerning this project.

As the Clearinghouse requirements have been complied with, we are closing our files on it at this time, unless there has been substantial change that you feel should be called to the attention of the state agencies.

Sincerely,



A. Thomas Wallace  
Federal Funds Coordinator

ATW/fjc  
Enclosure

SEP 18 1974



# Department of Soil Conservation



Grimes State Office Building / Des Moines, Iowa 50319  
Telephone: (515) 281-5851

William H. Greiner, Director

October 29, 1974

Mr. Wilson T. Moon  
State Conservationist  
Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309

Dear Wilson:

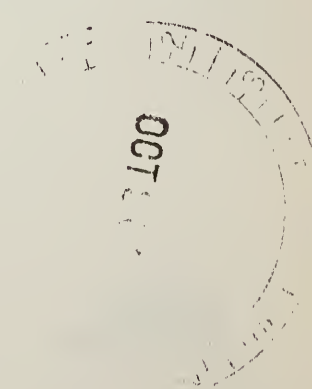
The Department of Soil Conservation has reviewed the Draft Environmental Impact Statement for the Pierce Creek No. 2 Watershed located in the Page and Montgomery County Soil Conservation Districts. The Department has also reviewed the Draft Work Plan for this project.

This is to advise that the Department of Soil Conservation has no additional comments to make on either document at this time.

Sincerely yours,

William H. Greiner  
Director

WHG:ejt



## State Soil Conservation Committee Members

Donald Johnson, Fairfield  
Chairman

J. Thomas Kenny, Akron  
Vice Chairman

George Annan, Clarinda  
Sherry R. Fisher, Des Moines

Walter Hagen, Waterville  
Carroll J. Hobson, Eldora

Gerald Norland, Cylinder  
Robert R. Welp, Ft. Dodge



# iowa department of environmental quality

kenneth m. karch, p.e., executive director

July 16, 1974

A. Thomas Wallace, Jr.  
Federal Funds Coordinator  
Office for Planning & Programming  
State Capitol  
L O C A L

Re: PNRS Letter of Intent  
Project: PNRS No. 750011  
Draft EIS for Pierce Creek  
No. 2 Watershed

Dear Mr. Wallace:

The above-referenced project has been reviewed by this Department.

This letter is to indicate that this agency has no comment to submit on this project.

We thank you for the opportunity to review this project.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'K M Karch', is written over the typed name of the executive director.

Kenneth M. Karch  
Executive Director

KMK/JL/afe

Iowa

a place  
to grow**THE IOWA STATE HIGHWAY COMMISSION** · 515-296-1101 · AMES, IOWA 50010

JOSEPH R. COUPAL, JR.  
Director

July 15, 1974

H. E. GUNNERSON  
Chief Engineer

REFER TO: Letter of Intent  
Project: 750011  
Soil Conservation Service  
Pierce Creek Watershed

Mr. A. Thomas Wallace, Jr.  
Federal Funds Coordinator  
Office for Planning and Programming  
523 East 12th Street  
Des Moines, Iowa 50319

Dear Mr. Wallace:

I have reviewed the above PNRS Letter of Intent. The project does not appear to conflict with any highway improvements presently programmed by the Iowa State Highway Commission.

Thank you for the opportunity to review this project.

Very truly yours,

Robert L. Humphrey  
Corridor Planning Engineer

TFJ:db





DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
REGION VII

FEDERAL BUILDING  
601 EAST 12TH STREET  
KANSAS CITY, MISSOURI 64106

October 24, 1974

OFFICE OF  
THE REGIONAL DIRECTOR

Mr. Wilson T. Moon  
State Conservationist  
Department of Agriculture  
823 Federal Building  
Des Moines, Iowa 50309


RE: Draft Environmental Impact Statement  
Pierce Creek Watershed No. 2  
Page and Montgomery Counties, Iowa

Dear Mr. Moon:

The opportunity to review the above referenced Environmental Impact Statement is appreciated and it would appear that the impacts of the proposed action and the reasonable alternatives have been adequately addressed.

This project has no impact on the programs or responsibilities of the Department of Health, Education, and Welfare.

Sincerely

  
William H. Henderson  
Regional Environmental Officer

cc: Phyllis Hayes (1)  
Warren Muir (2)



**DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD**

Appendix B

MAILING ADDRESS:  
U.S. COAST GUARD (G-WS/73)  
400 SEVENTH STREET SW.  
WASHINGTON, D.C. 20590  
PHONE: (202) 426-2262

• 24 OCT 1974

•  
Mr. Wilson T. Moon  
State Conservationist  
Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309

Dear Mr. Moon:

This is in response to your letter of 9 September 1974 addressed to the Commandant, Coast Guard concerning a draft environmental impact statement for the Pierce Creek No. 2 Watershed, Page and Montgomery Counties, Iowa.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

W. E. Caldwell

W. E. CALDWELL  
Captain, U.S. Coast Guard  
Deputy Chief, Office of Environmental  
By direction of the Commandant

STATE HISTORICAL DEPARTMENT OF IOWA  
DIVISION OF HISTORIC PRESERVATION

---

ADRIAN D. ANDERSON, DIRECTOR  
HISTORIC PRESERVATION OFFICER  
12 September 1974

To: U.S.D.A. Soil Conservation Service, Office of Planning

Re: PNRS No. 750011, Pierce Creek No. 2 Watershed

Gentlemen:

We are sorry that we could not comment on the above project for A-95 approval within the given time allotted. We realize that the project may already be authorized and/or implemented. However, you should be aware of the following facts concerning the project for your files:

There ~~are~~ no National Register sites in the project area;

There ~~are~~ no sites listed in the State Inventory in the project area;

There has not been a professional survey of the project area.

If there has been no professional survey of the project area your office should be aware that compliance with Executive Order 11593 has not been effected.

Sincerely,



Adrian D. Anderson, Director  
State Historic Preservation Officer

ADA:pas

cc: A. Thomas Wallace, Jr.  
Federal Funds Coordinator



STATE HISTORICAL DEPARTMENT OF IOWA  
DIVISION OF HISTORIC PRESERVATION

---

October 23, 1974

ADRIAN D. ANDERSON, DIRECTOR  
HISTORIC PRESERVATION OFFICER

Charles R. Cobb  
U.S. Department of Agriculture  
Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309

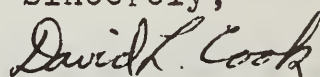
Dear Mr. Cobb:

In regards to the Draft Work Plan and the Draft Environmental Impact Statement for Pierce Creek No. 2 Watershed, in Page and Montgomery counties, our office recommends that archaeological-historical surveys be made of the affected area. There have been no professional surveys done for the area.

Negotiations for professional cultural resource surveys are highly recommended, so that your agency will have complied with Executive Order 11593.

If sites are found, Federal administration procedures (36 CFR 800) must be followed to insure proper consideration of the resources.

Sincerely,



David L. Cook  
Cultural Resource  
Specialist

Advisory Council  
On Historic Preservation

November 29, 1974

Mr. Wilson T. Moon  
State Conservationist  
U.S. Department of Agriculture  
Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309

Dear Mr. Moon:

This is in response to your request of September 9, 1974, received September 24, 1974, for comments on the environmental statement for the Pierce Creek No. 2 Watershed in Page and Montgomery Counties, Iowa. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that while you have discussed the historical, architectural, and archeological aspects related to the undertaking, the Advisory Council needs additional information to adequately evaluate the effects on these cultural resources. Please furnish additional data indicating:

Compliance with Executive Order 11593 of May 13, 1971

1. In the case of land under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will result in the transfer, sale, demolition, or substantial alteration of potential National Register properties. If such is the case, the nature of the effect should be clearly indicated.
2. In the case of lands not under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will contribute to the preservation and enhancement of non-federally owned districts, sites, buildings, structures, and objects of historical, archeological, architectural, or cultural significance.


The Council notes that the Service is preparing such a survey of the project area's historic and archeological resources. However, the Council cannot substantively comment until such information is furnished to it.

To insure a comprehensive review of historical, cultural, archeological, and architectural resources, the Advisory Council also suggests that

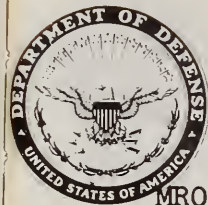
the environmental statement contain a copy of the comments of the appropriate State Historic Preservation Officer.

Should you have any questions or require any additional assistance, please contact Stephen Cochran of the Advisory Council staff at 202-254-3974.

Sincerely yours,

  
John D. McDermott  
Director, Office of Review and  
Compliance





DEPARTMENT OF THE ARMY  
OMAHA DISTRICT, CORPS OF ENGINEERS  
6014 U.S. POST OFFICE AND COURT HOUSE  
OMAHA, NEBRASKA 68102

MROPD-P

11 November 1974

Mr. Wilson T. Moon, State Conservationist  
U. S. Department of Agriculture  
Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309

Dear Mr. Moon:

This is in response to your letter dated 6 September 1974 requesting our review and comments on the draft watershed work plan and draft environmental impact statement for Pierce Creek No. 2 Watershed, Page and Montgomery Counties, Iowa.

Our review of the draft work plan indicates that nine grade stabilization structures are being considered in the watershed plan. The total area controlled by the nine structures is 3.8 square miles.

The hydrologic analysis of the nine structures complies with the intended 25-year design. Total reservoir storage capacity at the crest of each structure varies from 4.11 to 4.74 basin inches. These figures compare roughly with two-thirds Standard Project Flood runoff for this region.

Drainage from the proposed project area enters the East Nishnabotna River at several points ranging from one to four miles upstream of Essex, Iowa. If failure of the structures occurred, it is not likely that the limited storage provided in the proposed project would have a significant effect on flows in the East Nishnabotna River at Essex or downstream.

A comparison of the benefits and costs for structural measures on page 36 shows the benefit-cost ratio for structure H-1 as slightly more than 1.0 based on an interest rate of 5-5/8 percent. Applying the current interest rate of 5-7/8 percent to the economic analysis on structure H-1 would yield a benefit-cost ratio of slightly less than unity. Application of the current interest rate to the total project would not significantly affect the project benefit-cost ratio.

MROPD-P

Mr. Wilson T. Moon

11 November 1974

A review of the draft environmental impact statement resulted in two comments you may wish to consider in the final EIS. There appears to be a discrepancy between the draft EIS and Draft Work Plan. Page 1 of the Work Plan states that approximately 40 acres of cropland are damaged each year by flood waters whereas Page 1 of the Draft EIS indicates 20 acres. Also, page 7 of the draft EIS states that grasses and legumes to be planted will provide cover and food for wildlife. We feel that it would be desirable to indicate what kinds of grasses and legumes would be planted. Brome grass, for instance, is used extensively for terraces yet it has no food value and has little value for needed winter cover.

We appreciate the opportunity to comment on your proposed PL-566 project. It will have no effect on any authorized or planned Corps of Engineers' projects.

Sincerely yours,

C. F. THOMAS  
Chief, Planning Division



## United States Department of the Interior

## OFFICE OF THE SECRETARY

## MISSOURI BASIN REGION

IN REPLY REFER TO:

ER 74/1206

BUILDING 67, DENVER FEDERAL CENTER  
DENVER, COLORADO 80225

NOV 20 1974

Dear Mr. Moon:

In response to your letter of September 9, 1974, we have reviewed the draft Environmental Impact Statement on Pierce Creek No. 2 Watershed, Iowa. We offer these comments for your consideration.

General Comments

The statement adequately covers the impact of the project on fish and wildlife resources of the area. We believe that the two acres designated as wildlife mitigation in the vicinity of structure L-2 should be identified on a map in the final Environmental Impact Statement so its relationship to the retarding pool can be ascertained for future reference by State and Federal Wildlife biologists to assure accomplishment of loss mitigation measures.

No established or studied unit of the National Park System or any National Landmark (natural or historic) would be adversely affected by the proposed action.

We are pleased to note that the National Register of Historic Places and the State Historic Preservation Officer have been consulted and that it has been determined that no known cultural sites will be affected by the proposed project.

The final statement should provide assurance that if the scheduled archeological and historical investigation of the project area should reveal the presence of cultural resources now unknown, such resources will be carefully identified, expected project effects on them analyzed, and an appropriate program developed to avoid or mitigate adverse effects.

From this review of the draft work plan, it is our conclusion that the practices planned to accomplish needed land treatment--e.g. terraces, contour farming, grassed waterways, conservation tillage, and especially grade stabilization structures--will in the long run produce an enhancement of the recreational resource.



Because of the financial and technical assistance provided by the Federal Government on these non-Federal lands under Public Law 566, it is essential that recreational use of these resources be maximized to the degree that they are compatible with the landowner's farming operation. That is to say that limited forms of recreation such as hunting and fishing should not be arbitrarily denied the public. A need for public recreation for the area is also identified on page nine, under Recreation Resources.

The above is directed at the following quoted statement that appears on page 23 of the work plan, and page 20 of the Environmental Impact Statement.

The landowner or farm operator on whose land the pool is located may stock it with fish. None of these pools are adequate to support public recreation, therefore access will be at the discretion of the landowner. Limited recreational opportunities in the form of hunting, fishing, swimming, picnicking, and nature study will be available at these sites. These pools will be available for limited recreation for about 40 years at 3 of the sites and for 80 years or longer at the other 6. (Underlining added.)

It is confusing as to what this statement really is saying because having recreational opportunities available at these sites is of no value to the public if the landowner denies access. The subject statement should be clarified.

The Bureau of Mines interest in the project is possible involvement of mineral resources and mineral-production facilities. Both reports state that all structures will be constructed with earth available at the sites. Known mineral resources in the watershed, coal, sand, and gravel are mentioned in the reports, but effects of the project on mineral resources are not described.

The Bureau of Mines review indicates that small quantities of coal resources, but no known coal reserves, would be committed under the land required for project structural measures. No other known mineral resource or facility would be adversely affected. We recommend that qualified personnel determine the significance of the coal resource that would be lost under proposed dams and flood pools. Results of

the investigation should be noted in the revised environmental statement and work plan in a brief statement describing the effect of the project on mineral resources and industry.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Mr. Logan". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Special Assistant to the Secretary  
Missouri Basin Region

Mr. Wilson T. Moon  
State Conservationist  
Soil Conservation Service  
823 Federal Building  
Des Moines, IA 50309







UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Appendix B

REGION VII  
1735 BALTIMORE - ROOM 249  
KANSAS CITY, MISSOURI 64108

November 7, 1974

Mr. Wilson T. Moon  
State Conservationist  
U.S. Department of Agriculture  
Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309

Dear Mr. Moon:

We have reviewed the Draft Environmental Impact Statement for Pierce Creek No. 2 Watershed, Page and Montgomery Counties, Iowa. The project and statement are rated LO-2 indicating we have a lack of objections to the project as proposed. However, the final statement should contain additional information to fully account for the environmental impacts of the proposed actions. The following are our comments:

The statement indicates the silt retention structures may be used for fishing or other types of recreation at the discretion of the land owners. In addition, the water in these structures may also be used for wildlife and livestock watering. The proposed water retention structures will provide the area with relatively quiescent warm water ponds. Nutrients supplied to these ponds by runoff would be conducive to algal growth and possible odor and vector problems. Therefore, the information on present and future water quality should include evaluations of anticipated turbidity and pesticide and nutrient concentrations in the impounded water. Possible odor and vector attenuation measures should also be discussed in the final statement.

The final environmental impact statement should include a statement that rule 4.3(2)c (limitation of fugitive dust emissions) of the Iowa Environmental Quality Department Regulations will be adhered to during construction activities.

As indicated on page 16 an estimated 4.3 tons of soil per acre are eroded by upland gully erosion. On page 19, the statement indicates that gully erosion will be avoided by structural methods. A clarification of how upland gully erosion will be avoided by the structural methods proposed should be included in the final statement so that interested persons may understand the functioning of the retention structures.

In the section on Irreversible and Irretrievable commitments of Resources, the statement indicates eventually the inundated areas will become silted in by

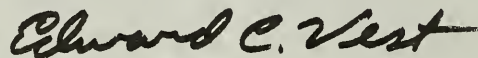
sediment. The approximate time for such occurrences and the future plans for these areas should be included in the impact statement. When sediment filling occurs, soil conservation measures may be thwarted with a possible resumption of heavy erosion. The final statement should discuss future sediment control when sedimentation of these proposed control structures occurs.

The section on Alternatives provides information on only one alternative, that of "no project." Other feasible alternatives such as land treatment measures without the structural measures should also be included in the environmental impact statement and evaluated as an alternative to the proposed action.

The impact statement indicates the proposed plan is compatible with developments planned by the Omaha District Corps of Engineers for the Nishnabotna River. The effects of this project should be analyzed in light of planned Corps projects in order to fully assess total impacts of Federal projects on the Nishnabotna River Basin.

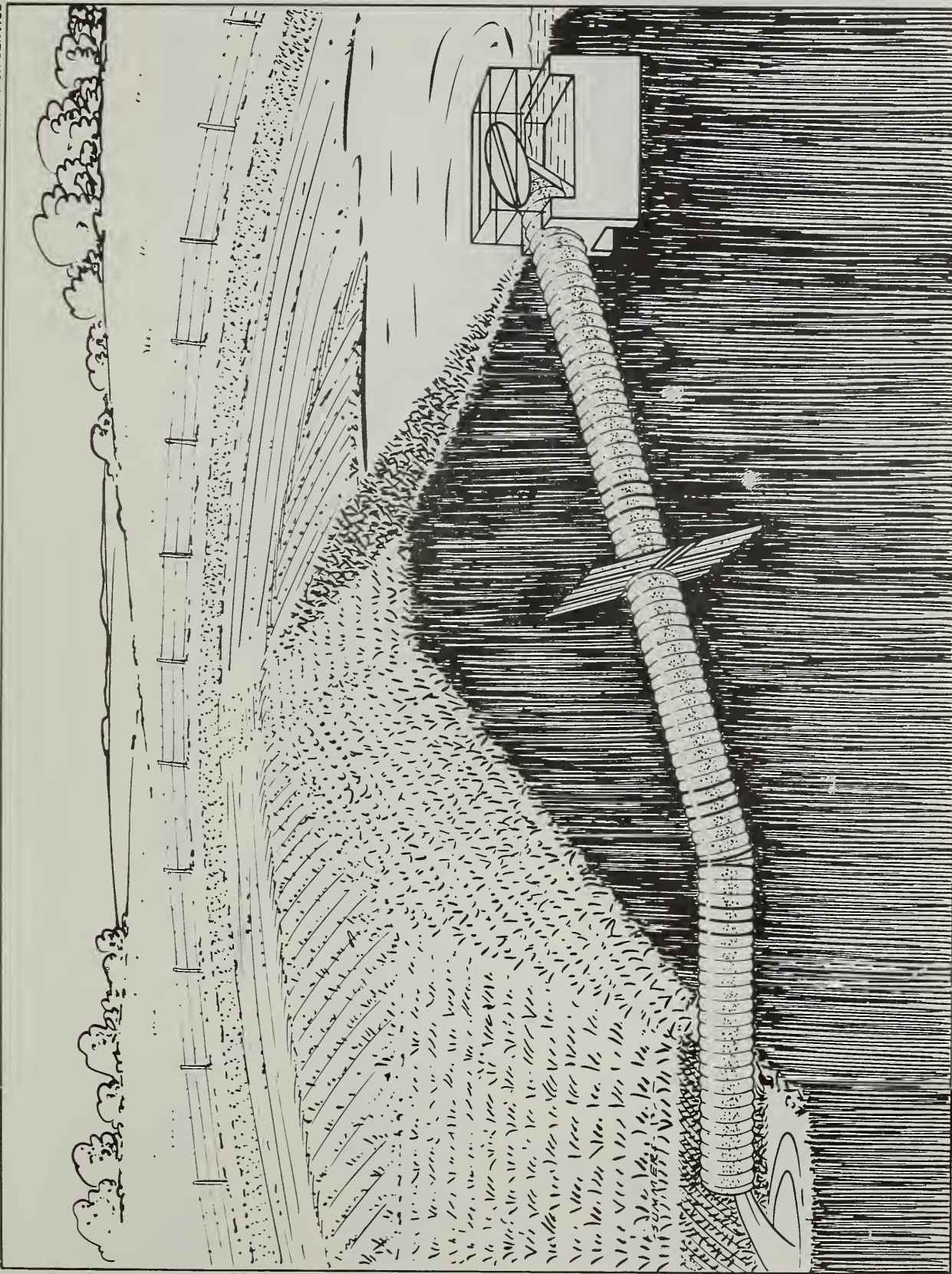
We appreciate the opportunity to review and comment on the draft impact statement. Please forward two copies of the final to us when it is filed with the Council on Environmental Quality.

Very truly yours,

A handwritten signature in black ink, reading "Edward C. Vest". The signature is written in a cursive style with a prominent "E" and a long, sweeping underline.

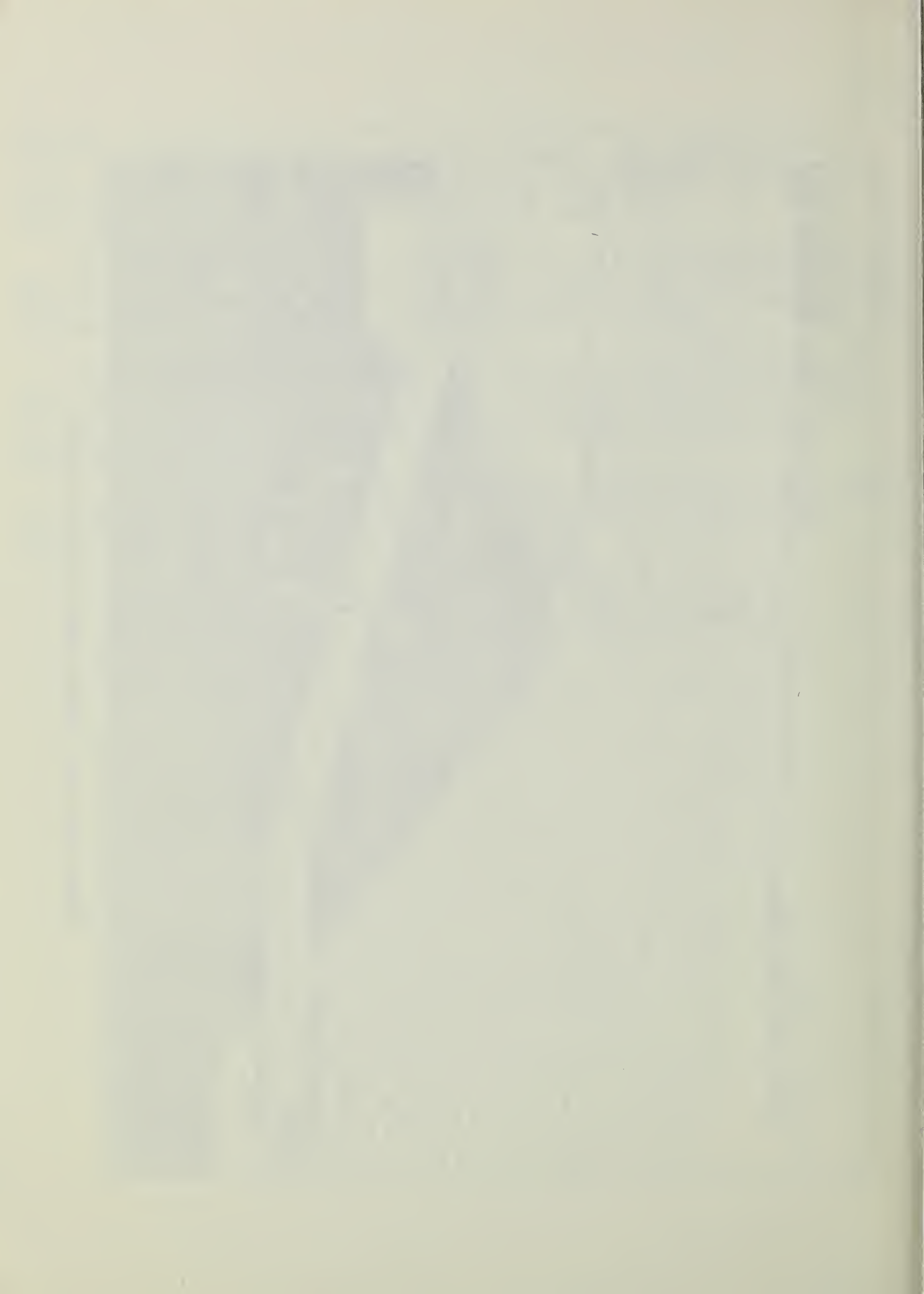
Edward C. Vest  
Environmental Impact Statement  
Coordinator





*Metal pipe with hooded inlet and trash guard.*





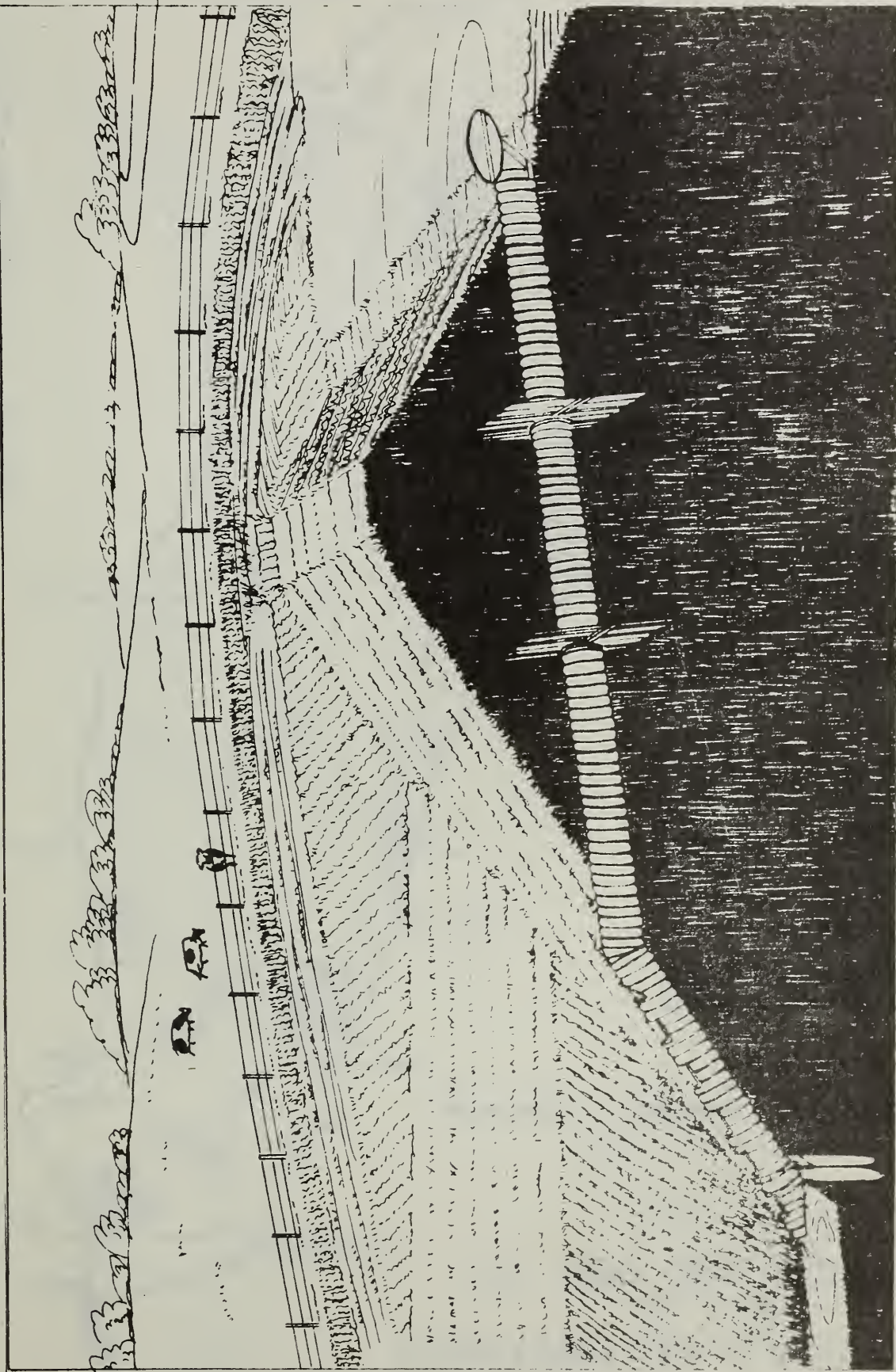


Figure 1

Metal pipe with headed inlet and slotted flame outlet





# WATERSHED STATUS LEGEND



PLANNING STAGE

OPERATION STAGE OR COMPLETED

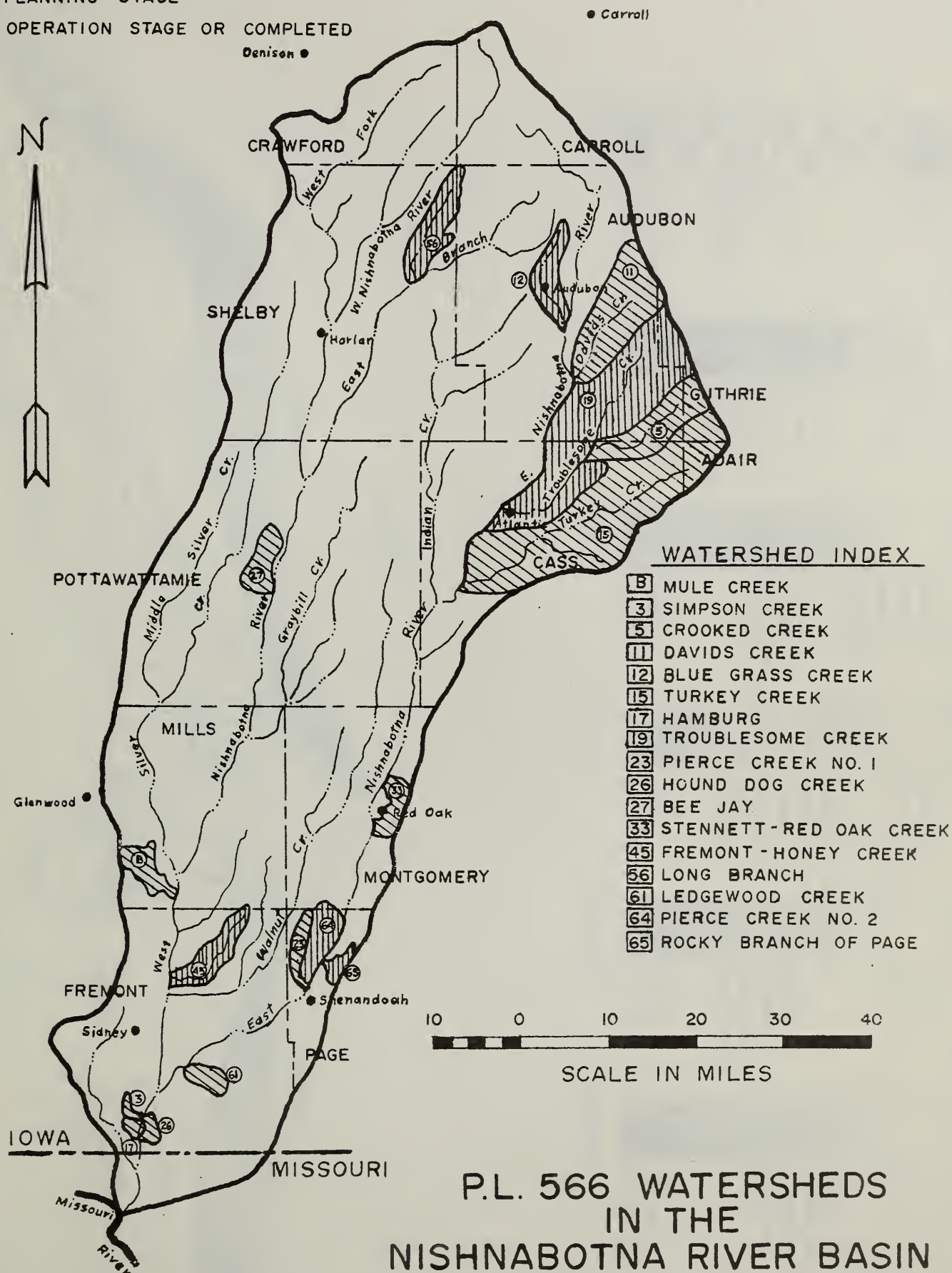


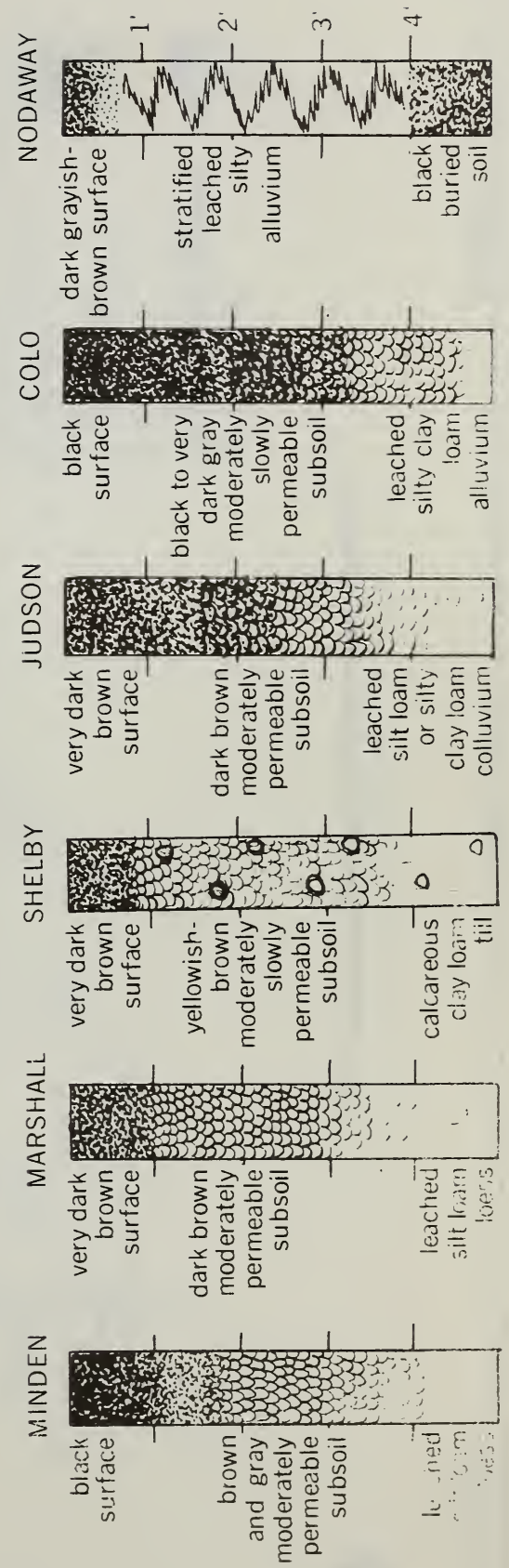
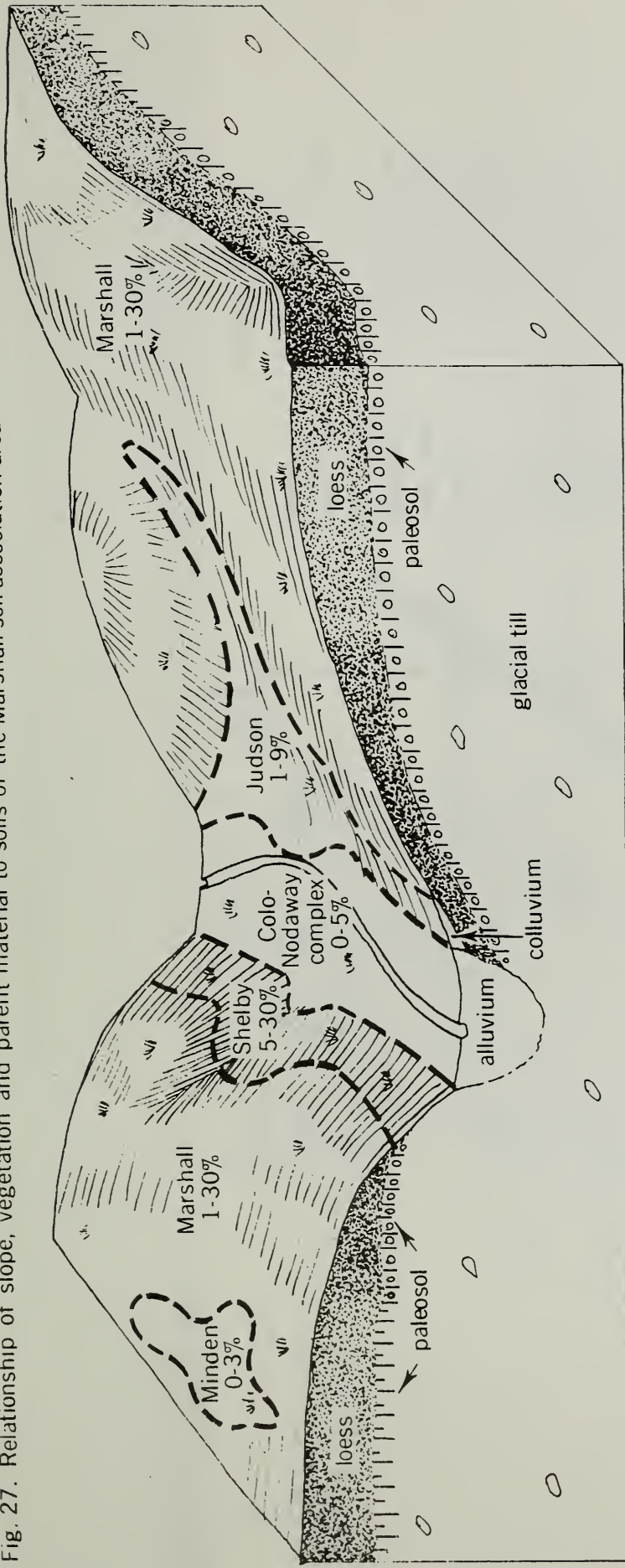
FIGURE 3

P.L. 566 WATERSHEDS  
IN THE  
NISHNABOTNA RIVER BASIN



Hand-drawn map of the  
region of the  
United States of America

Fig. 27. Relationship of slope, vegetation and parent material to soils of the Marshall soil association area







## R 39 W

